Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-14 (canceled).

Claim 15 (new): A method for the determination of a blood volume during an extracorporeal blood treatment with a blood treatment apparatus in an extracorporeal blood circuit, wherein the extracorporeal blood circuit includes an arterial branch of a blood line leading to the blood treatment apparatus and a venous branch of the blood line leading away from the blood treatment apparatus, the method comprising:

generating pulse waves in the extracorporeal blood circuit, wherein the pulse waves have at least one of a propagation rate and a transit time;

measuring the at least one of the propagation rate and the transit time of the pulse waves; and

determining the blood volume from the at least one of the measured propagation rate and the measured transit time of the pulse waves.

Claim 16 (new): The method of claim 15, wherein the pulse waves are generated by a blood pump arranged in the extracorporeal blood circuit.

Claim 17 (new): The method of claim 16, further comprising:

detecting the pulse waves by a first pressure sensor arranged in the extracorporeal blood circuit.

Claim 18 (new): The method of claim 17, wherein the blood pump is arranged in the arterial branch of the blood line upstream of the blood treatment apparatus, and the first pressure sensor is arranged in the venous branch of the blood line downstream of the blood treatment apparatus.

Claim 19 (new): The method of claim 18, further comprising:

detecting the pulse waves by a second pressure sensor, wherein the second pressure sensor is arranged in the arterial branch of the blood line upstream of the blood treatment apparatus.

Claim 20 (new): The method of claim 15, wherein determining the blood volume comprises determining a relative blood volume RBV(t) from a ratio of the at least one of the measured propagation rates and the measured transit times of the pulse waves at two different times t, t_0 of the extracorporeal blood treatment.

Claim 21 (new): The method of claim 19, wherein determining the blood volume comprises determining a relative blood volume RBV(t) from a ratio of the at least one of the measured

propagation rates and the measured transit times of the pulse waves at two different times t, t_0 of the extracorporeal blood treatment.

Claim 22 (new): The method of claim 20, wherein the relative blood volume RBV(t) is calculated from the temporal change in the measured transit times of the pulse waves according to the following equation:

$$RBV(t) = \frac{1 - \frac{\rho_w}{\rho(t_0)}}{\left(\frac{PTT(t)}{PTT(t_0)}\right)^2 - \frac{\rho_w}{\rho(t_0)}}$$

wherein PTT(t) and PTT(t_0) is the measured transit time of the pulse waves over a segment of the extracorporeal blood circuit with a predetermined length L at time t and t_0, respectively; and wherein ρ_w is the mass density of water and $\rho(t_0)$ is the mass density of the blood at the start of the extracorporeal blood treatment.

Claim 23 (new): The method of claim 21, wherein the relative blood volume RBV(t) is calculated from the temporal change in the measured transit times of the pulse waves according to the following equation:

$$RBV(t) = \frac{1 - \frac{\rho_w}{\rho(t_0)}}{\left(\frac{PTT(t)}{PTT(t_0)}\right)^2 - \frac{\rho_w}{\rho(t_0)}}$$

wherein PTT(t) and PTT(t_0) is the measured transit time of the pulse waves over a segment of the extracorporeal blood circuit with a predetermined length L at time t and t_0, respectively; and wherein ρ_w is the mass density of water and $\rho(t_0)$ is the mass density of the blood at the start of the extracorporeal blood treatment.

Claim 24 (new): A device for the determination of the blood volume during an extracorporeal blood treatment in an extracorporeal blood circuit, wherein the extracorporeal blood circuit includes an arterial branch of a blood line leading to a blood treatment apparatus and a venous branch of the blood line leading away from the blood treatment apparatus, the device comprising:

means for generating pulse waves in the extracorporeal blood circuit, wherein the pulse waves have at least one of a propagation rate and a transit time;

means for measuring the at least one of the propagation rate and the transit time of the pulse waves; and

means for determining the blood volume from the at least one of the measured propagation rate and the measured transit time of the pulse waves.

Claim 25 (new): The device of claim 24, wherein the means for generating pulse waves comprises a blood pump arranged in the extracorporeal blood circuit.

Claim 26 (new): The device of claim 25, further comprising:

a first pressure sensor for detecting the pulse waves, wherein the first pressure sensor is arranged in the extracorporeal blood circuit.

Claim 27 (new): The device of claim 26, wherein the blood pump is arranged in the arterial branch of the blood line upstream of the blood treatment apparatus, and the first pressure sensor is arranged in the venous branch of the blood line downstream of the blood treatment apparatus.

Claim 28 (new): The device of claim 27, further comprising:

a second pressure sensor for detecting the pulse waves, wherein the second pressure sensor is arranged in the arterial branch of the blood line upstream of the blood treatment apparatus.

Claim 29 (new): The device of claim 24, wherein the means for determining the blood volume are adapted to determine a relative blood volume RBV(t) from a ratio of the at least one of the measured propagation rates and the measured transit times of the pulse waves at two different times t, t_0 of the extracorporeal blood treatment.

Claim 30 (new): The device of claim 28, wherein the means for determining the blood volume are adapted to determine a relative blood volume RBV(t) from a ratio of the at least one of the measured propagation rates and the measured transit times of the pulse waves at two different times t, t_0 of the extracorporeal blood treatment.

Claim 31 (new): The device of claim 29, wherein the means for determining the blood volume are adapted to calculate the relative blood volume RBV(t) from the temporal change in the measured transit times of the pulse waves according to the following equation:

$$RBV(t) = \frac{1 - \frac{\rho_w}{\rho(t_0)}}{\left(\frac{PTT(t)}{PTT(t_0)}\right)^2 - \frac{\rho_w}{\rho(t_0)}}$$

wherein PTT(t) and PTT(t_0) is the measured transit time of the pulse waves over a segment of the extracorporeal blood circuit with a predetermined length L at time t and t_0, respectively; and wherein ρ_w is the mass density of water and $\rho(t_0)$ is the mass density of the blood at the start of the extracorporeal blood treatment.

Claim 32 (new): The device of claim 30, wherein the means for determining the blood volume are adapted to calculate the relative blood volume RBV(t) from the temporal change in the measured transit times of the pulse waves according to the following equation:

$$RBV(t) = \frac{1 - \frac{\rho_w}{\rho(t_0)}}{\left(\frac{PTT(t)}{PTT(t_0)}\right)^2 - \frac{\rho_w}{\rho(t_0)}}$$

wherein PTT(t) and PTT(t_0) is the measured transit time of the pulse waves over a segment of the extracorporeal blood circuit with a predetermined length L at time t and t_0, respectively; and wherein ρ_w is the mass density of water and $\rho(t_0)$ is the mass density of the blood at the start of the extracorporeal blood treatment.